

**TWO NEW SPECIES OF *MACROCHELES* FROM AUSTRALIA
(ACARINA: MESOSTIGMATA: MACROCHELIDAE)**

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Abstract

Macrocheles faveolus sp. n. and *Macrocheles virgo* sp. n. (Acarina: Mesostigmata: Macrochelidae) are described from leaf litter in northern Queensland.

Introduction

This paper forms part of a series dealing with the *Macrocheles* of Australia (Acarina: Mesostigmata: Macrochelidae), a series that will eventually include data on more than 50 species (Halliday 1986a, 1990). Two species have been selected for early description because one of them, *Macrocheles virgo* sp. n., was the subject of a biological study, and a name is required before the results of that study can be published. In order to adequately define *M. virgo*, it was also necessary to describe a closely related species, *M. faveolus* sp. n. The descriptions are based on specimens in the Australian National Insect Collection (ANIC). The system of notation used for the dorsal shield setae is that of Lindquist and Evans (1965) as applied to the Macrochelidae by Halliday (1986b, 1987). The system of notation used for the leg setae is that of Evans (1963).

***Macrocheles faveolus* sp. n. (Figs 1, 2, 4, 6-11)**

Types - QUEENSLAND: *Holotype* female: Mt Tiptree, alt. 840 m, 29.vi.1971, rainforest leaf litter, R.W. Taylor and J. Feehan, ANIC347. **Paratypes** (all QUEENSLAND): 41 females, 1 male, same data as holotype; 19 females, Mt Tiptree, alt. 730 m, 29.vi.1971, rainforest leaf litter, R.W. Taylor and J. Feehan, ANIC345/346; 10 females (+ lab-reared progeny of these, comprising 1 male, 4 deutonymphs, 1 protonymph, 4 larvae), Mt Tiptree, 13.vii.1984, rainforest leaf litter; R. B. Halliday, QLD22-18; 6 females, Tully Falls, 4.x.1978, rainforest leaf litter, A. Walford-Huggins, ANIC683; 1 female, Cooktown, base of Mt Cook, May 1981, dung-baited pitfall trap, J. Feehan, QLD11-23a; 2 females, Lake Barrine, 1.vii.1971, rainforest leaf litter, R.W. Taylor and J. Feehan; 5 females, Cammoo Caves (near Rockhampton), 25.x.1976, dense forest, R.W. Taylor and T. Weir, ANIC535; 1 female, 1 male, Mt Haig, alt 1140 m, 30.vi.1971, rainforest leaf litter, R.W. Taylor and J. Feehan, ANIC349; 1 female, Ravenshoe State Forest, 1.x.1987, rainforest leaf litter, A. Walford-Huggins; 1 female, Eungella National Park, 10.xi.1976, R.W. Taylor and T. Weir, ANIC563; 25 females, Eacham National Park, 27.iv.1973, rainforest leaf litter, R.W. Taylor, ANIC466.

Female

Colour: In life, dark brown, often with much adhering debris.

Dorsal shield (Fig. 1): Oval shaped; anterior and antero-lateral margins smooth, slightly undulating, postero-lateral margins with fine serrations and widely spaced larger teeth, posterior margin finely serrated; length 731-857 μm , width 542-630 μm ($n=20$); ornamented throughout with an irregular pattern of polygonal cells separated by ridges; this pattern most strongly developed postero-medially and weakest antero-medially; each polygonal cell enclosing many minute papillae; shield with 29 pairs of setae and 22 pairs of pores. Setae $z1$ fine, smooth, short, curved sharply inwards at the base; $j5$, $z5$, $j6$, $z6$, $J1$, $J5$ fine, pointed, lightly pilose, all other setae long, distally thickened, heavily pilose.

Ventral surface: Sternal shield (Fig. 2) highly ornamented, divided into a series of irregular polygonal fields separated by ridges; antero-lateral fields finely granular, posterior fields with a smaller number of smooth papillae; medial and postero-medial area of shield usually with approximately 8 much smaller fields; shield with 3 pairs of setae and 2 pairs of lyriform pores; anterior pair of setae long and distally pilose, second and third pairs of setae shorter, smooth or very lightly pilose. Epigynial shield similarly ornamented, with straight posterior margin and indistinct irregular anterior margin, epigynial setae strongly pilose for most of their length. Metasternal plates unornamented, each with an anterior pore and a coarsely pilose posterior seta. Ventri-anal shield (Fig. 4) wider than long, length 252-307 μm , length 319-399 μm , ratio length/width 1.14-1.39 ($n=20$). Shield strongly ornamented with an irregular pattern of polygonal fields separated by ridges, each field enclosing a large number of small papillae; shield carrying 3 pairs of pre-anal setae, a pair of para-anal setae and an unpaired post-anal seta; pre-anal setae coarsely pilose for most of their length, para-anal setae smooth and pointed, post-anal seta short, distally pilose. Unsclerotised integument laterad of ventri-anal shield striated, with 2 pairs of metapodal plates and 5 pairs of strongly pilose setae.

Gnathosoma: Epistome with a long bifurcate median process, lightly spiculate basally, pointed lateral processes, and serrated lateral margins (Fig. 6). Fixed digit of chelicera with two triangular teeth, a low blunt proximal tooth and a terminal hook (Fig. 7); pilus dentilis short and fine, dorsal seta conspicuous, flattened; movable digit with two triangular teeth and a terminal hook. Hypostome with 5 rows of denticles, each row with more than 20 denticles, and a smooth anterior transverse line, denticles in middle row noticeably fewer and coarser than the other 4 rows (Fig. 8). Other features of gnathosoma normal for genus.

Spermathecal structures: Sacculus foemineus with two sessile rami opening into a single unpaired sac (Fig. 9).

Legs: Surface of legs strongly rugose, especially on the dorsal surface of each segment. Chaetotaxy: Leg I: coxa 0 0/1 0/1 0, trochanter 1 0/1 0/2 1, femur 2 3/1 2/3 2, genu 2 3/1 2/1 2, tibia 2 3/2 2/1 2; Leg II: coxa 0 0/1 0/1 0, trochanter 1 0/1 0/2 1, femur 2 3/1 2/2 1, genu 2 3/1 2/1 2, tibia 2 2/1 2/1 2,

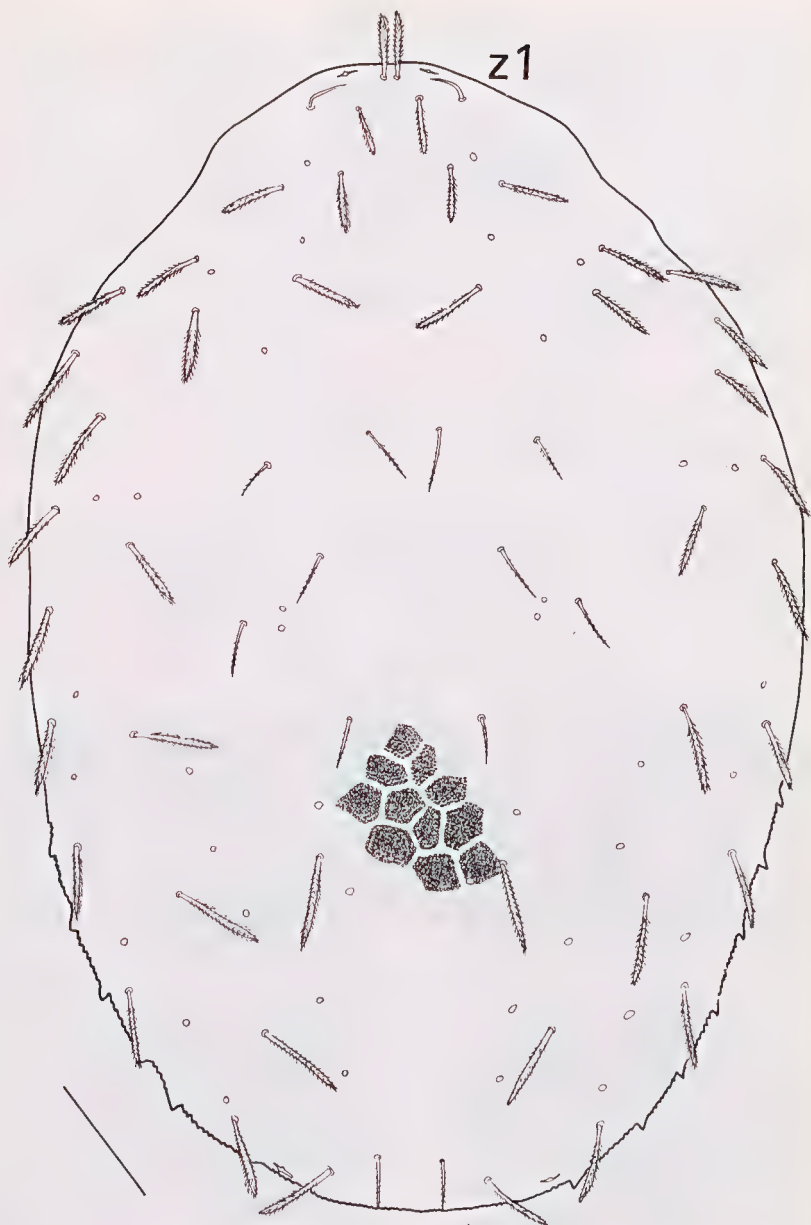


Fig 1. *Macrocheles faveolus* sp. n.: dorsal shield of female. Scale bar represents 100 μ m.

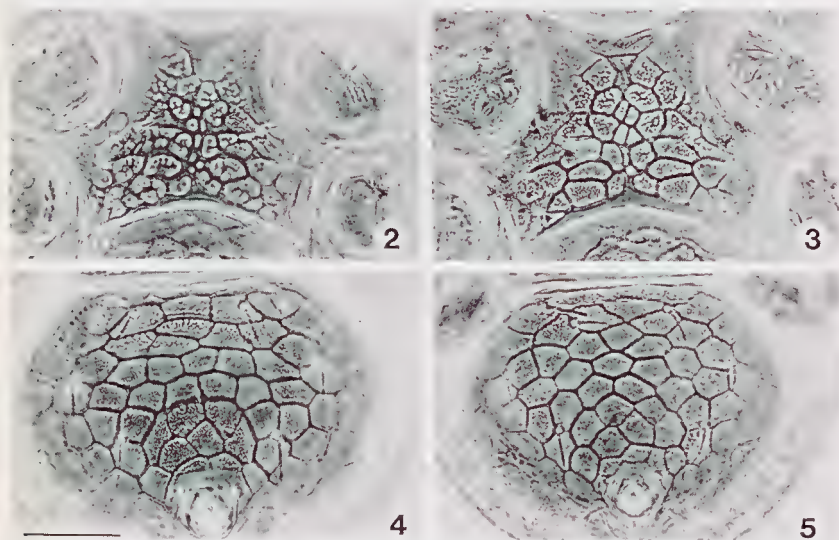
tarsus 3 3/2 3/2 3 + mv, md; Leg III: coxa 0 0/1 0/1 0, trochanter 1 1/1 0/1 1, femur 1 2/1 1/0 1, genu 1 2/1 2/0 1, tibia 1 1/1 2/1 1, tarsus 3 3/2 3/2 3 + mv, md; Leg IV: coxa 0 0/1 0/0 0, trochanter 1 1/2 0/1 0, femur 1 2/1 1/0 1, genu 1 2/1 2/0 0, tibia 1 1/1 2/1 1, tarsus 3 3/2 3/2 3 + mv, md. Most dorsal and lateral setae strongly pilose in their distal half, ventral setae finer and smooth or lightly pilose. Postero-lateral seta on tibia IV strongly expanded, much longer and thicker than the other setae on this segment, with a fringe of short pilosity at the tip (Fig 10). Postero-lateral setae on tarsus IV lightly pilose, much longer and thicker than antero-lateral setae on this segment. Pre-tarsi II-IV with opercula long, projecting well beyond claws, trifurcate; lateral lobes of pulvillus similar in length to medial lobe.

Male

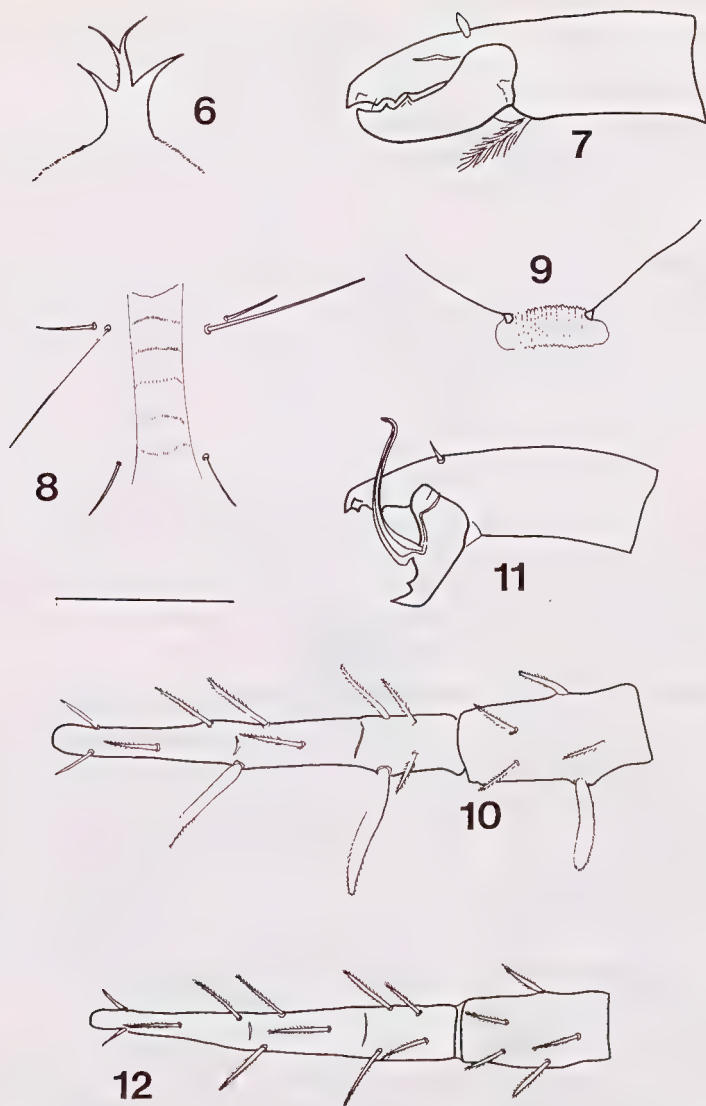
Colour: In life, yellow-brown, often with much adhering debris.

Dorsal shield: Length 596-609 μm , width 462-470 μm (n=3), structure and chaetotaxy as for female.

Ventral surface: Sternal, epigynial, metasternal, metapodal, and ventri-anal shields all fused to form a single holovenral shield. Shield ornamented throughout with papillae arranged in groups; 4-8 papillae per group in sternal and genital areas, 10-20 per group in ventri-anal area; shield carrying 9 pairs of setae and the post-anal seta, setae all fine, smooth, pointed except for slight pilosity on the pre-anal setae; most pores obscured by ornamentation.



Figs 2-5. *Macrocheles* spp., females: (2) *M. faveolus* sp. n., sternal shield; (3) *M. virgo* sp. n., sternal shield; (4) *M. faveolus* sp. n., ventri-anal shield; (5) *M. virgo* sp. n., ventri-anal shield. Scale bar represents 100 μm .



Figs 6-12. *Macrocheles* spp. (6) - (11) *Macrocheles faveolus* sp. n.: (6) epistome of female; (7) chelicera of female; (8) hypostome of female; (9) sacculus foemineus of female; (10) tibia and tarsus IV of female, dorsal aspect, pre-tarsus not shown; (11) chelicera of male; (12) *Macrocheles virgo* sp. n., tibia and tarsus IV, dorsal aspect, pre-tarsus not shown. Scale bar represents 100 μ m for (6), (7), (8), (9), (11), (12); 160 μ m for (10).

Gnathosoma: Fixed digit of chelicera with 3 triangular teeth and a terminal hook, movable digit with one triangular tooth and a terminal hook, spermatodactyl long, curved, gently tapering to a fine sharply recurved tip (Fig. 11). Other features of gnathosoma as for female.

Legs: Structure and chaetotaxy as for female, except with the addition of a thumb-like spur on the ventral surface of femur II, seta av on genu II and tibia II reduced to a short thick spine; leg IV unarmed.

Notes

A female specimen of *M. faveolus* collected alive from Mt Tiptree laid eggs in the laboratory, and one of these developed into an adult male. This observation is consistent with the most common mode of reproduction in the genus, arrhenotokous parthenogenesis. This lab-reared male was used as the basis for identifying the two field-collected males.

Macrocheles virgo sp. n. (Figs 3, 5, 12, 13)

Types - QUEENSLAND: Holotype female: 45 km N of Cairns, Cook Highway, 13.i.1991, sandy littoral rainforest litter, M. Manning; Paratypes: 1 female, same data as holotype; 3 females, Mt Webb National Park, 28.iv.-3.v.1981, dung baited pitfall trap, A. Calder and J. Feehan.

Female

Colour: In life, dark brown, often with much adhering debris.

Dorsal shield (Fig. 13): Oval shaped; anterior and antero-lateral margins smooth, slightly undulating, postero-lateral margins with fine serrations and widely spaced larger teeth, posterior margin finely serrated; length 693-928 μm , width 529-676 μm ($n=6$); ornamented throughout with an irregular pattern of polygonal cells separated by ridges; this pattern equally distinct throughout, including antero-median region; each polygonal cell enclosing many minute papillae; shield with 29 pairs of setae and 22 pairs of pores. Seta z1 coarsely pilose for most of its length, all other dorsal shield setae long, distally thickened, heavily pilose; only z5 noticeably thinner and more lightly pilose than surrounding setae.

Ventral surface: Sternal shield (Fig. 3) highly ornamented, divided into a series of irregular polygonal fields separated by ridges; polygonal fields all enclosing very large numbers of minute papillae; medial and postero-medial region of shield usually with approximately 8 smaller fields; shield with 3 pairs of setae and 2 pairs of lyriiform pores; anterior pair of setae long, heavily pilose distally; second and third pairs of setae much shorter, fine, smooth, pointed. Epigynial and metasternal shields as for *M. faveolus*. Ventri-anal shield (Fig. 5) wider than long, length 252-327 μm , width 323-432 μm , ratio length/width 1.26-1.54 ($n=6$); structure of shield and surrounding integument as for *M. faveolus*.

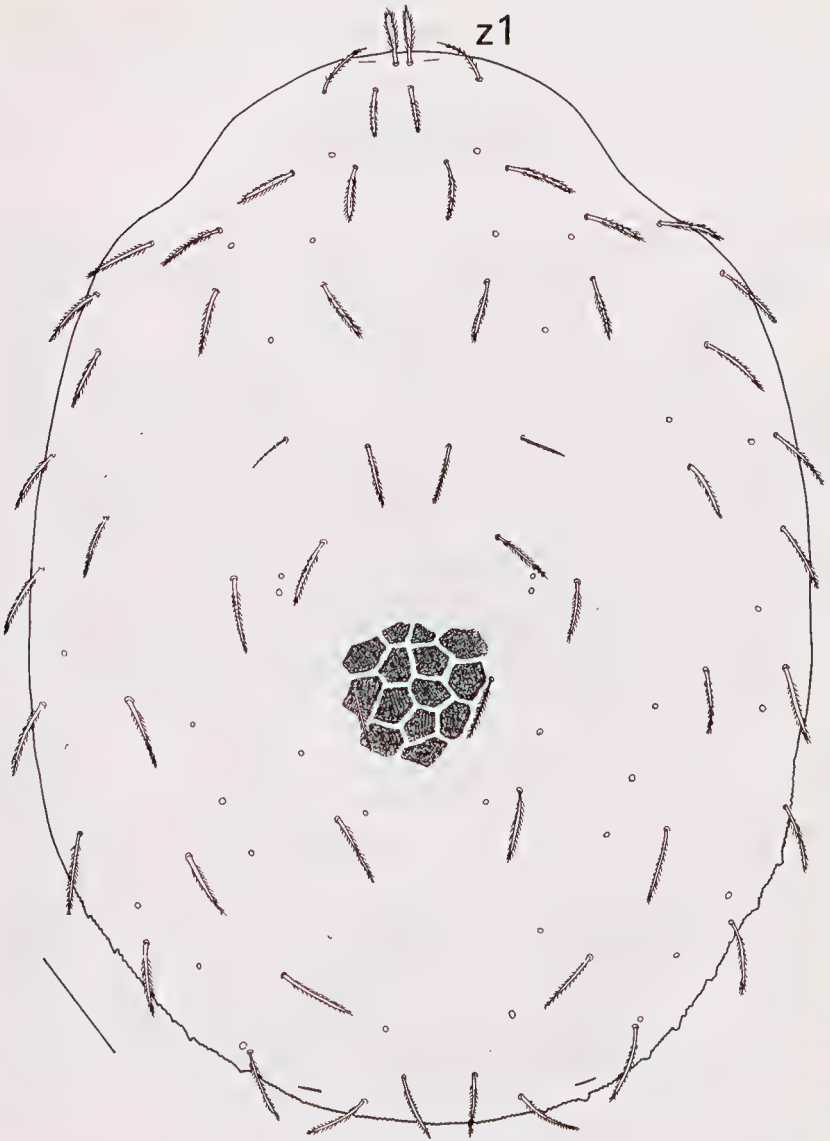


Fig. 13. *Macrocheles virgo* sp. n. Dorsal shield of female. Scale bar represents 100 μ m.

Gnathosoma: Epistome, chelicera, and hypostome as for *M. faveolus*. Spermathecal structures not clearly visible in any of the available specimens.

Legs: Chaetotaxy as for *M. faveolus*, except tibia and tarsus IV lacking conspicuous macrosetae, postero-lateral setae on these segments similar in size and morphology to the surrounding setae (Fig 12).

Male: Unknown.

Discussion

Macrocheles faveolus and *M. virgo* may be distinguished on the basis of three characters — (1) dorsal shield setae z1 are fine and smooth in *M. faveolus*, but coarsely pilose for most of their length in *M. virgo*; (2) the polygonal fields in the postero-lateral area of the sternal shield of *M. faveolus* are smooth, or composed of no more than 12 large smooth papillae, while those of *M. virgo* contain great numbers of very fine papillae; (3) *M. faveolus* has postero-lateral macrosetae of distinctive morphology on tibia and tarsus IV, while in *M. virgo* these setae are similar in size and structure to the surrounding setae on these segments. Together these two species may be distinguished from other members of the genus by the following combination of characters—29 pairs of dorsal shield setae; most dorsal shield setae very thick and heavily pilose; ventri-anal shield wider than long, with distinctive polygonal ornamentation; most ventral shield setae pilose. The two species have overlapping geographic ranges in northern Queensland, and have been found together at Mt Tiptree.

Acknowledgments

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